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# Statewide Skilled Worker Demand vs Supply of Post-secondary Graduates : Gap Analysis

Maine Community College System

Jim McGowan

*Maine Community College System*

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**Statewide Skilled Worker Demand  
vs.  
Supply of Post-secondary Graduates**

***GAP ANALYSIS***

Prepared for the  
Governor's Community College Advisory Council  
April 3, 2006

by  
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## **Introduction**

This document was developed for the Governor's Community College Advisory Council. At the request of Governor John Baldacci, the Maine Community College System created the Council "...to examine and recommend how Maine's Community Colleges may be developed to meet the state's current and foreseeable education and workforce needs." One of the Council's specific tasks was to conduct a "gap analysis," identifying gaps between the foreseeable demand for workers educated at the community college level, and the current supply capacity of the Maine Community College System and similar education programs. This document provides that analysis.

The report is divided into three sections. Section I outlines the method used for analysis. Findings from the review are reported in Section II, and conclusions are made in Section III. A matrix of related program completers and projected employment openings is included in an appendix.

## **Section I. Methodology**

The review method selected draws on nationally recognized, readily available and validated databases and processes to ensure the highest possible level of reliability, consistency and confidence. The process was selected in consultation with individuals who are knowledgeable about Maine's educational offerings and workforce, and the available databases. As with any projections, these are the best estimates, given current levels of understanding and barring considerable economic changes.

The outcome compares actual completion data from similar Maine programs for the base year of 2004 against the estimated annual average Maine employment opportunities for related occupations for the period of 2002-2012. This is the most current data available. Assuming similar future completer rates and the general accuracy of the workforce projections, any gap between the two would be expected to repeat annually, with minimal variation unless changed by other factors. The process used consisted of four basic steps using established systems and processes from the U.S. Departments of Education and Labor.

Step 1: Identifying similar programs and completion levels. The first steps of the process were to identify all credit certificate, diploma and Associate Degree programs offered by the Maine Community College System, identify which other Maine institutions offer similar programs and then determine the total number of completers from all programs. Programs in Liberal Studies, General Studies and Multi-/Interdisciplinary Studies were not included in this study.

In addition to Maine's Community Colleges, institutions with similar offerings included private two-year colleges as well as public and private colleges and universities that primarily offer four-year and advanced degrees. To gather this information the IPEDS (Integrated Postsecondary Education Data System) maintained by the US Department of

Education's National Center for Education Statistics (NCES) was used. The most recent completer data available was for the 2003-2004 academic year.

IPEDS is NCES' core postsecondary education data collection program. Institutional reporting is a requirement of the Higher Education Act of 1992. Among the information that is collected from postsecondary institutions is the number of completers by unique program areas. By using IPEDS' Peer Analysis System, customized data searches can be accomplished on the Internet. The number of completers at the certificate, diploma and Associate degree levels were sought for all institutions in a comparison set. Noncredit offerings were not included.

Academic programs are classified by the use of CIP (Classification of Instructional Programs) codes. These six digit codes, developed to facilitate NCES' collection and reporting, classify postsecondary academic offerings into one of sixty program cluster areas with multiple offerings in each. The cluster areas are designated by the first two digits of the CIP Code. Program titles assigned to the CIP code areas will vary from program titles used by individual institutions.

Programs with identical CIP codes were included in this review. Programs with similar CIP codes were explored further to see if identical occupational codes from the next step were shared between institutions. Matches of occupational codes between programs with similar CIP codes were included in this analysis.

More information about NCES and IPEDS can be obtained online from [necs.ed.gov](http://necs.ed.gov) and [necs.ed.gov/ipeds](http://necs.ed.gov/ipeds) respectively.

Step 2: Matching academic programs to likely occupational titles. The second step of the process was to determine which occupational job titles are related to those programs and therefore would be likely positions for successful completers. The NCES website provides a crosswalk reference of CIP coded programs to related occupational job titles classified by Standard Occupational Classification (SOC). SOC was developed by the US Department of Labor and is used to classify workers into one of 23 major industrial groupings, each with multiple broad occupational listings. The result from this step is a listing of probable employment opportunities by SOC for each unique academic program. Due to the diversity of employment occupations, a single academic program may have multiple positions from various major SOC industry classifications.

By strictly adhering to the CIP and SOC coding systems as well as the crosswalk determinations, this review gains validity. The initial program coding decisions by an institution shapes all that follows for this exercise. The program connections to specific occupational titles through the CIP-SOC crosswalk did not always include titles that would otherwise seem likely and occasionally included titles that could be viewed as less likely matches due to the emphasis of individual programs. Ultimately, the choice between increased flexibility and validity required less flexibility to maintain a higher level of validity.

Step 3: Projecting estimated employment demand. The third step of the process was to estimate the projected employment needs for these occupational titles. Every two years workforce projections are made at the SOC title level for a ten year period. The national projections are made by the US Bureau of Labor Statistics, and the state projections are made by the Maine Department of Labor. The most current Maine data is for the projection period of 2002-2012. A new projection covering 2004-2014 is expected to be published during the summer of 2006. The statewide projections include the overall estimated employment change, the average annual number of openings due to growth and replacement demand, average wage, and general education and training requirements.

By using the SOC codes from the previous step, the average number of annual openings can be identified. Any position that is listed more than once in relationship to specific programs, was only counted once in determining occupational projections. All positions with a listed general education and training requirement of an Associate Degree or less were included. All positions with a listed general education and training requirement of a Masters Degree or higher were automatically deleted from further use. Positions with a general education and training referencing the Bachelors Degree level were compared against another US Department of Labor program: O\*NET (the Occupational Information Network).

The O\*NET database uses SOC position codes and among other things, establishes a ratio of educational attainment based on survey information of actual position holders between the ages of 25 and 44. By combining the percentage of individuals currently working in the position with less than a Bachelors Degree, a ratio is established to apply against the total estimated average annual openings to determine a realistic representation of opportunity for program completers at less than a Bachelors level. More information regarding O\*NET can be found at [online.onetcenter.org](http://online.onetcenter.org).

Step 4: Combining the data. The final step of the process consisted of comparing the supply data on program completers to the projected demand data of the labor market. Using as the base year the completers of similar programs offered by the Maine Community College System for the 2003-2004 academic year, that number is compared against the annual average openings for related occupational titles.

The resulting “gap” represents the difference between the projected annual average occupational openings for the period of 2002-2012 and the annual number of expected completers from Maine Community College System and similar academic programs based on completers at the end of the 2003-2004 academic year. The results are organized by CIP code since organizing by SOC code would be problematic for occupations appearing in more than one academic program area.

This method does not assume all related openings will be filled by a graduate of these programs, but those individuals would be likely to be more qualified applicants with stronger career options in that field. Neither is there any attempt to adjust the gap based on the number of program completers that are already employed in their selected field of studies.

## Section II. Findings

Step 1: Identifying similar programs and completion levels. The preliminary search of the IPEDS Peer Analysis System used the following criteria: Maine based degree granting institutions at all award levels. This search resulted in 31 institutions being identified. Institutions with programs at only the Bachelor's level or above were then deleted, resulting in 22 institutions. After the programs of the Maine Community College System were identified, a manual search for only those institutions that offer similar programs further reduced the list to 19. That list included each of Maine's seven Community Colleges, Andover College, Beal College, Central Maine Medical Center, Husson College, Maine Maritime Academy, Saint Joseph's College, Thomas College, University of New England, University of Maine at Augusta, University of Maine at Machias, University of Maine at Presque Isle, and University of Southern Maine.

Based on CIP classification, and precluding Liberal Studies, General Studies and Multi-/Interdisciplinary Studies programs, the Maine Community Colleges offered eighty-eight unique programs at the certificate, diploma and/or Associate Degree levels in 2004. Seventeen of the programs had identical coding to those offered by other Maine institutions. An additional nine related programs at other Maine institutions were identified to have different CIP codes but similar occupational profiles and were included.

The programs represent twenty separate CIP Clusters with the Maine Community Colleges offering, for the purpose of this exercise, exclusive programming in thirteen of the areas. It should be noted that other institutions may offer courses in these cluster areas, but if they do, there was not a match between CIP program codes or related occupational listings. Nine other institutions offered programs in the Business Cluster and seven offered programs in the Health Professions Cluster. Overlapping with other institutions in other CIP cluster areas was minimal.

Postsecondary programs at the Associate Degree level or less offered (solely) through MCCS:

- 03. Natural Resources & Conservation
- 10. Communications Technologies/Technicians & Support Services
- 12. Personal & Culinary Services
- 13. Education
- 15. Engineering Technologies/Technicians
- 22. Legal Professions & Studies
- 26. Biological & Biomedical Sciences
- 41. Science Technologies/Technicians
- 43. Security & Protection Services
- 46. Construction Trades
- 47. Mechanic & Repair Technologies/Technicians
- 48. Precision Production
- 49. Transportation & Material Moving



Postsecondary programs at the Associate Degree or less  
offered by MCCS and other institutions

- 01. Agriculture, Agriculture Operations & Related Services
- 11. Computer & Information Sciences & Support Services
- 19. Family & Consumer Sciences/Human Sciences
- 31. Parks, Recreation, Leisure & Fitness Studies
- 50. Visual & Performing Arts
- 51. Health Professions & Related Clinical Sciences
- 52. Business, Management, Marketing & Related Support Services

The way individual institutions code their offerings impacts reporting. It should be noted that similar occupational opportunities exist for completers of programs in cluster areas of Education and Family & Consumer Sciences as Preschool Teachers. There were also additional Law Enforcement programs with different CIP codes and no matching SOC titles below the Master's Degree level. Therefore neither the completers nor estimated average annual openings for those programs and additional occupations were included in this review.

IPEDS reported a total of 2,291 completers from the ninety-seven programs of all institutions. Of that number, 1,620 (70.7%) received a certificate, diploma or Associate's Degree from the Maine Community College System. The remaining 671 completers came from one of the nineteen remaining institutions with similar programs.

Step 2: Matching academic programs to likely occupational titles. By using the National Center for Education Statistics' CIP to SOC crosswalk, a total of 228 unduplicated SOC occupational titles in 19 different SOC cluster areas were identified for the ninety-seven unique program areas. Only occupations listed in the crosswalk were included in this analysis, although other titles may have seemed reasonable for inclusion.

Step 3: Projecting estimated employment demand. Once the related SOC titles were identified, a search for those titles was made in the Maine Department of Labor publication *Maine Employment Outlook to 2012*. Among other things, this publication estimates Maine's annual average employment openings due to growth and labor replacement for the period of 2002-2012. Related information from all three steps was then placed into a matrix which is included in the appendix.

Step 4: Combining the data. The matrix reflects all related academic programs, the number of completers from all institutions for 2004, related occupations for each program, and their projected average annual openings. A summary by CIP cluster of both completers and projected average annual employment openings is also included.

In the matrix, programs are presented by CIP code and title with a total number of completers (column TC, for total completers) from all related Maine institutions. Programs with identical CIP codes to those offered by the Maine Community College

System are listed first in numerical order. If related, but not identically coded programs were identified, they were listed with their CIP code in parenthesis.

Across from each listed program area are the related occupational titles by SOC code and their projected average annual openings (column AP, for annual projection). An “x” in the AP column means the projection value has already been used or the general education and training requirement for the position is at the Master’s Degree level or higher. If a SOC is repeated, an asterisk (\*) follows the code and the projected annual average employment is not listed to avoid duplicate counting. If a position appears in more than one CIP cluster, the projected employment is only counted in the first cluster. N/A stands for not applicable and N/L means no value was listed.

All occupations with a general education and training requirement of an Associate Degree or lower are included with their projected average annual openings. Of the total of 228 unduplicated occupational titles, eleven had general education and training requirements of a Masters Degree or above and are listed, but no values for projected average annual openings for these positions were included for this analysis. A total of twenty-six occupational titles with a general education and training requirement at the Bachelor Degree level are *italicized*, and the values listed as projected average annual openings are calculated using the O\*NET ratio explained earlier. Based on the survey data, the percentage of individuals working in these occupations without a Bachelors Degree ranges from 13% to 78.6%, with a median value of 33.1%.

The summary tallies the total of completers and projected average annual employment by CIP clusters. Since multiple SOC codes will only be counted once, caution should be used in assuming too much from these summaries by clusters.

### Section III. Conclusions

Analyses such as this are more art than science. Outcomes are dependent on coding systems, crosswalks and the accuracy of economic projections. By maintaining project validity and excluding the addition of potentially related openings, these results can be viewed as conservative. A carefully designed and documented process can give valuable insights to ongoing and currently unmet workforce demands.

- ***The supply of completers from MCCS and related college level programs account for only 35% of the average annual openings projected for the Maine economy through 2012.*** Using 2004 as a base year, 2,291 individuals completed certificate, diploma or Associate Degree programs in Maine at a time when the projected average annual openings for related occupations was 6,521. Assuming no significant changes in conditions or performance, a gap of 4,234 openings will occur annually until some part of this equation changes. This ongoing gap can only create additional pressure on Maine’s economy to find skilled workers to sustain employment levels or cause business decisions to be made based on a declining available labor force.

- ***MCCS programs produce a significant number of certified students for the Maine economy.*** Of the 2,291 completers from all related programs for this study, 1,620 (70.7%) came from a MCCS program. The remaining 671 completers came from 19 separate public and private institutions.
- ***Many MCCS programs are the sole postsecondary education offering below the Bachelors Degree level, and represent a significant share of job opportunities in Maine.*** With the exception of Business and Health programs, most other program areas covered by this analysis are serviced primarily through the Maine Community College System. This is especially true in high employment demand areas such as Construction, Mechanic & Repair Technologies/Technicians, Precision Production, and Culinary Services.

CIP	Program Title	TC	AP	SOC	Related Position Titles
<b>01.</b>	<b>Agriculture, Agriculture Operations &amp; Related Sciences</b>				
01.0101	Agricultural Business & Management, General	2	17	11-9011	<i>Farm, Ranch &amp; Other Agricultural Managers</i>
			16	11-9012	Farmers & Ranchers
			N/L	25-1041	Agricultural Sciences Teachers, Postsecondary
01.0601	Applied Horticulture/Horticulture Operations, General	14	N/L	25-1041*	Agricultural Sciences Teachers, Postsecondary
			N/L	37-3019	Grounds Maintenance Workers, All Other
<b>03.</b>	<b>Natural Resources &amp; Conservation</b>				
03.0511	Forest Technology/Technician	34	1	19-4093	Forest & Conservation Technicians
<b>10.</b>	<b>Communications Technologies/Technicians &amp; Support Services</b>				
10.0305	Graphic & Printing Equipment Operator, General Production	17	31	43-9021	Data Entry Keyers
			3	43-9081	Proofreaders & Copy Markers
			4	51-5021	Job Printers
			8	51-5022	Prepress Technicians & Workers
			21	51-5023	Printing Machine Operators
10.9999	Communications Technologies/Technicians & Support Services, Other	12	N/A	no listing	
<b>11.</b>	<b>Computer &amp; Information Sciences &amp; Support Services</b>				
11.0201	Computer Programming/Programmer, General	11	7	15-1021	<i>Computer Programmers</i>
			x	25-1021	Computer Science Teachers, Postsecondary
			5	51-4012	Numerical Tool & Process Control Programmers
11.0401	Information Science/Studies	14	13	11-3021	<i>Computer &amp; Information Systems Managers</i>
			x	15-1011	Computer & Information Scientists, Research
			2	15-1032	<i>Computer Software Engineers, Systems Software</i>
			12	15-1071	<i>Network &amp; Computer Systems Administrators</i>
			10	15-1099	Computer Specialists, All Other
			x	25-1021*	Computer Science Teachers, Postsecondary
11.0901	Computer Systems Networking & Telecommunications	17	x	15-1071*	<i>Network &amp; Computer Systems Administrators</i>
			7	15-1081	<i>Network Systems &amp; Data Communications Analysts</i>
(11.0101)	Computer & Information Sciences, General	23	x	11-3021*	<i>Computer &amp; Information Systems Managers</i>
			x	15-1011*	Computer & Information Scientists, Research

			16	15-1051	Computer Systems Analysts
			4	15-1061	Database Administrators
			x	15-1071*	Network & Computer Systems Administrators
			x	15-1081*	Network Systems & Data Communications Analysts
			x	15-1099*	Computer Specialists, All Other
			x	25-1021*	Computer Science Teachers, Postsecondary
<b>12.</b>	<b>Personal &amp; Culinary Services</b>				
12.0503	Culinary Arts/Chef Training	34	44	35-1011	Chefs & Head Cooks
			0	35-2013	Cooks, Private Household
			173	35-2014	Cooks, Restaurant
			N/L	35-2019	Cooks, All Other
12.0504	Restaurant, Culinary & Catering Management/Manager	6	57	11-9051	Food Service Managers
			118	35-1012	First-Line Supervisors/Managers of Food Prep. & Serving Workers
12.0599	Culinary Arts & Related Services, Other	25	72	35-2012	Cooks, Institution & Cafeteria
<b>13.</b>	<b>Education</b>				
13.1210	Early Childhood Education & Teaching	37	50	25-2011	Preschool Teachers, Except Special Education
			15	25-2012	Kindergarten Teachers, Except Special Education
13.1501	Teacher Assistant/Aide	15	225	25-9041	Teacher Assistants
<b>15</b>	<b>Engineering Technologies/Technicians</b>				
15.0101	Architectural Engineering Technology/Technician	8	N/L	17-3029	Engineering Technicians, Except Drafters, All Other
15.0303	Electrical/Electronic/Communications Engr Technology/Technician	17	16	17-3023	Electrical & Electronic Engineering Technicians
15.0399	Electrical/Electronic Engineering Technologies/Technicians, Other	12	x	17-3023*	Electrical & Electronic Engineering Technicians
15.0403	Electromechanical Technology/Electromechanical Engineering Tech	18	5	51-2023	Electromechanical Equipment Assemblers
15.0404	Instrumentation Technology/Technician	8	5	49-9069	Precision Instrument & Equipment Repairers, All Other
15.0501	Heating/AC/Refrigeration Technology/Technician	4	68	49-9021	Heating, Air Conditioning & Refrigeration Mechanics & Installers
15.0599	Environmental Control Technologies/Technicians, Other	2	x	17-3029*	Engineering Technicians, Except Drafters, All Other
15.0701	Occupational Safety & Health Technology/Technician	4	N/L	29-9011	Occupational Health & Safety Specialists

15.0805	Mechanical Engineering/Mechanical Technology/Technician	3	2	17-3027	Mechanical Engineering Technicians
15.1001	Construction Engineering Technology/Technician	13	26	11-9021	<i>Construction Managers</i>
			18	13-1051	Cost Estimators
			11	17-3022	Civil Engineering Technicians
15.1201	Computer Engineering Technology/Technician	30	x	17-3023*	Electrical & Electronic Engineering Technicians
15.1301	Drafting & Design Technology/Technician, General	22	16	17-3011	Architectural & Civil Drafters
			N/L	17-3019	Drafters, All Other
15.1302	CAD/CADD Drafting and/or Design Technology/Technician	7	x	17-3011*	Architectural & Civil Drafters
15.1303	Architectural Drafting & Architectural CAD/CADD	14	x	17-3011*	Architectural & Civil Drafters
<b>19</b>	<b>Family &amp; Consumer Sciences/Human Sciences</b>				
19.0706	Child Development	38	0	25-9021	<i>Farm &amp; Home Management Advisors</i>
(19.0708)	Child Care & Support Services Management	20	x	25-2011*	Preschool Teachers, Except Special Education
			N/L	25-1192	Home Economics Teachers, Postsecondary
<b>22.</b>	<b>Legal Professions &amp; Studies</b>				
22.0301	Legal Administrative Assistant/Secretary	6	23	43-6012	Legal Secretaries
<b>24.</b>	<b>Liberal Arts &amp; Sciences, General Studies &amp; Humanities</b>				
24.0102	General Studies	N/A	N/A	N/A	
24.0199	Liberal Arts & Sciences General Studies & Humanities, Other	N/A	N/A	N/A	
<b>26.</b>	<b>Biological &amp; Biomedical Sciences</b>				
26.1302	Marine Biology & Biological Oceanography	4	1	11-9121	<i>Natural Sciences Managers</i>
			N/L	19-1029	Biological Scientists, All Other
			x	25-1042	Biological Science Teachers, Postsecondary
<b>30.</b>	<b>Multi-/Interdisciplinary Studies</b>				
30.9999	Multi-/Interdisciplinary Studies, Other	N/A	N/A	N/A	

<b>31.</b>	<b>Parks, Recreation, Leisure &amp; Fitness Studies</b>				
31.0101	Parks, Recreation & Leisure Studies	7	x	25-1193	Recreation & Fitness Studies Teachers, Postsecondary
			29	39-9032	<i>Recreation Workers</i>
<b>41.</b>	<b>Science Technologies/Technicians</b>				
41.0101	Biology Technician/Biotechnology Laboratory Technician	3	23	19-4021	Biological Technicians
<b>43.</b>	<b>Security &amp; Protective Services</b>				
43.0107	Criminal Justice/Police Science	42	x	25-1111	Criminal Justice & Law Enforcement Teachers, Postsecondary
			2	33-3011	Bailiffs
			18	33-3021	Detectives & Criminal Investigators
			121	33-3051	Police & Sheriff's Patrol Officers
			6	33-9021	Private Detectives & Investigators
43.0203	Fire Science/Firefighting	14	103	33-2011	Fire Fighters
			2	33-2021	Fire Inspectors & Investigators
			3	33-2022	Forest Fire Inspectors & Prevention Specialists
<b>46.</b>	<b>Construction Trades</b>				
46.0000	Construction Trades, General	13	x	no listing	
46.0101	Mason/Masonry	1	66	47-1011	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			7	47-2021	Brickmasons & Blockmasons
			2	47-2022	Stonemasons
			3	47-2044	Tile & Marble Setters
			11	47-3011	Helpers-Brick, Block, Stone Masons & Tile & Marble Setters
46.0201	Carpentry/Carpenter	9	x	47-1011*	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			204	47-2031	Carpenters
			22	47-3012	Helpers-Carpenters
46.0302	Electrician	76	x	47-1011*	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			82	47-2111	Electricians
			24	47-3013	Helpers-Electricians
			2	49-2098	Security & Fire Alarm Systems Installers
			1	49-9097	Signal & Track Switch Repairers
46.0303	Lineworker	9	x	47-1011*	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			25	49-9051	Electrical Power-Line Installers & Repairers

46.0502	Pipefitting/Pipefitter & Sprinkler Fitter	1	57	47-2152	Plumbers, Pipefitters & Steamfitters
46.0503	Plumbing Technology/Plumber	22	x	47-1011*	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			8	47-2151	Pipelayers
			x	47-2152*	Plumbers, Pipefitters & Steamfitters
			8	47-3015	Helpers-Pipelayers, Plumbers, Pipefitters & Steamfitters
			3	47-4071	Septic Tank Servicers & Sewer Pipe Cleaners
46.9999	Construction Trades, Other	2	x	47-1011*	First-Line Sups/Mgrs of Construction Trades & Extraction Workers
			4	47-2041	Carpet Installers
			0	47-2042	Floor Layers, Except Carpet, Wood & Hard Tiles
			2	47-2043	Floor Sanders & Finishers
			68	47-2061	Construction Laborers
			3	47-2082	Tapers
			13	47-2130	Insulation Workers
			N/L	47-2131	Insulation Workers, Floor, Ceiling & Wall
			N/L	47-2132	Insulation Workers, Mechanical
			0	47-2161	Plasterers & Stucco Masons
			N/L	47-2171	Reinforcing Iron & Rebar Workers
			5	47-2221	Structural Iron & Steel Workers
			2	47-4031	Fence Erectors
			10	47-4041	Hazardous Materials Removal Workers
			4	47-4999	Construction Trades & Related Workers, All Other
<b>47.</b>	<b>Mechanic &amp; Repair Technologies/Technicians</b>				
47.0104	Computer Installation & Repair Technology/Technician	48	15	49-2011	Computer, Automated Teller & Office Machine Repairers
			9	49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equip.
47.0201	Heating/AC/Ventilation/Refrig Maint Technology/Technician	24	x	49-9021*	Heating, AC & Refrigeration Mechanics & Installers
47.0302	Heavy Equipment Maintenance Technology/Technician	7	23	49-3042	Mobile Heavy Equipment Mechanics, Except Engines
			1	49-3043	Rail Car Repairers
			5	51-2031	Engine & Other Machine Assemblers
47.0303	Industrial Mechanics & Maintenance Technology	1	7	47-4021	Elevator Installers & Repairers
			16	49-9041	Industrial Machinery Mechanics
			10	49-9043	Maintenance Workers, Machinery
			18	49-9044	Millwrights
			N/L	49-9045	Refractory Materials Repairers, Except Brickmasons
			20	49-9098	Helpers-Installation, Maintenance & Repair Workers
			x	51-2031*	Engine & Other Machine Assemblers



			N/L	51-6062	Textile Cutting Machine Setters, Operators & Tenders
			4	51-6063	Textile Knitting & Weaving Machine Setters, Operators & Tenders
			6	51-6064	Tex. Winding, Twisting & Drawing Out Mach. Setters, Oprs. & Tdrs.
47.0603	Autobody/Collision & Repair Technology/Technician	13	36	49-3021	Automotive Body & Related Repairers
			4	49-3022	Automotive Glass Installers & Repairers
			203	49-3023	Automotive Service Technicians & Mechanics
			17	51-9122	Painters, Transportation Equipment
47.0604	Automobile/Automotive Mechanics Technology/Technician	68	8	49-2093	Electrical & Electronics Installers & Rep, Transportation Equipment
			2	49-2096	Electronic Equipment Installers & Repairers, Motor Vehicles
			x	49-3023*	Automotive Service Technicians & Mechanics
47.0605	Diesel Mechanics Technology/Technician	9	56	49-3031	Bus & Truck Mechanics & Diesel Engine Specialists
47.0616	Marine Maintenance/Fitter & Ship Repair Technology/Technician	2	30	49-3051	Motorboat Mechanics
			14	51-2091	Fiberglass Laminators & Fabricators
47.0699	Vehicle Maintenance & Repair Technologies, Other	12	8	49-3092	Recreational Vehicle Service Technicians
47.9999	Mechanic & Repair Technologies/Technicians, Other	11	x	47-4041*	Hazardous Materials Removal Workers
<b>48.</b>	<b>Precision Production</b>				
48.0501	Machine Tool Technology/Machinist	58	3	51-4021	Extruding & Drawing Mach. Setters, Oprs. & Tenders, Met. & Plastic
			N/L	51-4022	Forging Machine Setters, Operators & Tenders, Metal & Plastic
			5	51-4023	Rolling Machine Setters, Operators & Tenders, Metal & Plastic
			20	51-4031	Cutting Punching & Press Mach. Setters, Oprs & Tdrs, Met. & Pls.
			5	51-4032	Drilling & Boring Mach. Tool Setters, Oprs. & Tenders, Met & Pls.
			5	51-4033	Grd, Lpg, Pol. & Buffing Mach. Tool Strs, Oprs. & Tdrs, M & P
			4	51-4034	Lathe & Turning Mach. Tool Setters, Operators & Tenders, M & P
			N/L	51-4035	Milling & Planing Machine Setters, Operators & Tenders, M & P
			55	51-4041	Machinists
			7	51-4081	Multiple Machine Tool Setters, Operators & Tenders, M & P
			N/L	51-4191	Heat Treating Equipment Setters, Operators & Tenders, M & P
			N/L	51-4192	Lay-Out Workers, Metal & Plastic
			3	51-4199	Metal Workers & Plastic Workers, All Other
48.0506	Sheet Metal Technology/Sheetworking	20	26	47-2211	Sheet Metal Workers
			x	51-4023*	Rolling Machine Setters, Operators & Tenders, Metal & Plastic
			x	51-4031*	Cutting Punching & Press Mach. Setters, Oprs & Tdrs, Met. & Pls.
			N/L	51-4061	Model Makers, Metal & Plastic
			N/L	51-4062	Patternmakers, Metal & Plastic

48.0508	Welding Technology/Welder	29	48	51-4121	Welders, Cutters, Solderers & Brazers
			8	51-4122	Welders, Soldering & Brazing Mach. Setters, Operators & Tenders
<b>49.</b>	<b>Transportation &amp; Materials Moving</b>				
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation	20	8	47-2071	Paving, Surfacing & Tamping Equipment Operators
			N/L	47-2072	Pile-Driver Operators
			50	47-2073	Operating Engineers & Other Construction Equipment Operators
			50	47-4051	Highway Maintenance Workers
			2	47-4061	Rail-Track Laying & Maintenance Equipment Operators
			x	47-4999*	Construction Trades & Related Workers, All Other
			3	47-5021	Earth Drillers, Except Oil & Gas
			N/L	47-5041	Continuous Mining Machine Operators
			N/L	47-5042	Mine Cutting & Channeling Machine Operators
			1	47-5049	Mining Machine Operators, All Other
			N/L	47-5099	Extraction Workers, All Other
			9	49-9096	Riggers
			5	53-7021	Crane & Tower Operators
			N/L	53-7031	Dredge Operators
			26	53-7032	Excavating & Loading Machine & Dragline Operators
			N/L	53-7041	Hoist & Winch Operators
<b>50.</b>	<b>Visual &amp; Performing Arts</b>				
50.0699	Film/Video & Photographic Arts, Other	21	x	25-1121	Art, Drama & Music Teachers, Postsecondary
			15	27-4021	Photographers
50.9999	Visual & Performing Arts, Other	15	x	25-1121*	Art, Drama & Music Teachers, Postsecondary
(50.0605)	Photography	7	x	27-4021*	Photographers
			x	25-1121*	Art, Drama & Music Teachers, Postsecondary
<b>51.</b>	<b>Health Professions &amp; Related Clinical Sciences</b>				
51.0707	Health Information/Medical Records Technology/Technician	63	61	29-2071	Medical Records & Health Information Technicians
51.0708	Medical Transcription/Transcriptionist	24	30	31-9094	Medical Transcriptionists
51.0716	Medical Administrative/Executive Assistant & Medical Secretary	41	130	31-9092	Medical Assistants
			108	43-6011	Executive Secretaries & Administrative Assistants
			75	43-6013	Medical Secretaries

51.0801	Medical/Clinical Assistant	72	x	31-9092*	Medical Assistants
			8	31-9093	Medical Equipment Preparers
51.0803	Occupational Therapist Assistant	6	x	25-1071	Health Specialties Teachers, Postsecondary
			4	31-2011	Occupational Therapist Assistants
			4	31-2012	Occupational Therapist Aides
51.0805	Pharmacy Technician/Assistant	5	x	25-1071*	Health Specialties Teachers, Postsecondary
			44	29-2052	Pharmacy Technicians
			3	31-9095	Pharmacy Aides
51.0806	Physical Therapist Assistant	3	x	25-1071*	Health Specialties Teachers, Postsecondary
			21	31-2021	Physical Therapist Assistants
			7	31-2022	Physical Therapist Aides
51.0901	Cardiovascular Technology/Technologist	5	x	25-1071*	Health Specialties Teachers, Postsecondary
			13	29-2031	Cardiovascular Technologists & Technicians
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	18	x	25-1071*	Health Specialties Teachers, Postsecondary
			49	29-2041	Emergency Medical Technicians & Paramedics
			1	53-3011	Ambulance Drivers & Attendants, Except Emer. Med. Technicians
51.0907	Medical Radiologic Technology/Science-Radiation Therapist	26	x	25-1071*	Health Specialties Teachers, Postsecondary
			3	29-1124	Radiation Therapists
			34	29-2034	Radiologic Technologists & Technicians
51.0908	Respiratory Care Therapy/Therapist	25	x	25-1071*	Health Specialties Teachers, Postsecondary
			31	29-1126	Respiratory Therapists
			3	29-2054	Respiratory Therapy Technicians
51.0909	Surgical Technology/Technologist	2	x	25-1071*	Health Specialties Teachers, Postsecondary
			16	29-2055	Surgical Technologists
51.1004	Clinical/Medical Laboratory Technician	12	x	25-1071*	Health Specialties Teachers, Postsecondary
			30	29-2012	Medical & Clinical Laboratory Technicians
51.1599	Mental & Social Health Services & Allied Professions, Other	59	x	21-1011	Substance Abuse & Behavioral Disorder Counselors
			x	21-1014	Mental Health Counselors
			N/L	21-1019	Counselors, All Other
			262	21-1093	Social & Human Service Assistants
			N/L	21-1099	Community & Social Service Specialists, All Other
51.1601	Nursing/Registered Nurse (RN, ASN, BSN, MSN)	266	x	25-1072	Nursing Instructors & Teachers, Postsecondary

			619	29-1111	Registered Nurses
51.1613	Licensed Practical/Vocational Nurse Training	28	83	29-2061	Licensed Practical & Licensed Vocational Nurses
51.3103	Dietetic Technician (DTR)	5	6	29-2051	Dietetic Technicians
51.3104	Dietitian Assistant	4	x	29-2051*	Dietetic Technicians
(51.0705)	Medical Office Management/Administration	13	x	31-9092*	Medical Assistant
(51.1699)	Nursing, Other	47	x	29.1111*	Registered Nurses
			x	25-1072*	Nursing Instructors & Teachers, Postsecondary
<b>52.</b>	<b>Business, Management, Marketing &amp; Related Support Services</b>				
52.0201	Business Administration & Management, General	201	26	11-1011	Chief Executives
			194	11-1021	General & Operations Managers
			16	11-2022	Sales Managers
			20	11-3011	Administrative Services Managers
			8	11-3051	Industrial Production Managers
			16	11-3071	Transportation, Storage & Distribution Managers
			x	11-9021*	Construction Managers
			18	11-9151	Social & Community Service Managers
			93	11-9199	Managers, All Others
			x	13-1051*	Cost Estimators
			12	13-1111	Management Analysts
			x	25-1011	Business Teachers, Postsecondary
52.0204	Office Management & Supervision	13	141	43-1011	First-Line Sups./Mgrs. of Office & Admin. Support Workers
52.0301	Accounting	48	29	13-2011	Accountants & Auditors
			2	13-2031	Budget Analysts
			N/L	13-2041	Credit Analysts
			1	13-2061	Financial Examiners
			6	13-2081	Tax Examiners, Collectors & Revenue Agents
			x	25-1011*	Business Teachers, Postsecondary
52.0302	Accounting Technology/Technician & Bookkeeping	27	8	13-2082	Tax Preparers
			57	43-3021	Billing & Posting Clerks & Machine Operators
			184	43-3031	Bookkeeping, Accounting & Auditing Clerks
			N/L	43-3041	Gaming Cage Workers
			25	43-3051	Payroll & Timekeeping Clerks
			2	43-4011	Brokerage Clerks

			2	43-9111	Statistical Assistants
52.0401	Administrative Assistant & Secretarial Science, General	62	x	43-6011*	Executive Secretaries & Administrative Assistants
			180	43-6014	Secretaries, Except Legal, Medical & Executive
52.0402	Executive Assistant/Executive Secretary	19	x	43-6011*	Executive Secretaries & Administrative Assistants
			x	43-6014*	Secretaries, Except Legal, Medical & Executive
52.0408	General Office Occupations & Clerical Services	11	6	43-3061	Procurement Clerks
			3	43-4021	Correspondence Clerks
			29	43-4031	Court, Municipal & License Clerks
			21	43-4071	File Clerks
			27	43-4151	Order Clerks
			20	43-4161	Human Resources Assistants, Except Payroll & Timekeeping
			187	43-4171	Receptionists & Information Clerks
			N/L	43-4199	All Other Financial, Information & Records Clerks
			4	43-5011	Cargo & Freight Agents
			17	43-5051	Postal Service Clerks
			52	43-5052	Postal Service Mail Carriers
			34	43-5053	Postal Service Mail Sorters, Processors & Processing Mach. Oprtrs.
			71	43-5071	Shipping, Receiving & Traffic Clerks
			7	43-5111	Weighers, Measurers, Checkers & Samplers, Recordkeeping
			34	43-9022	Word Processors & Typists
			19	43-9041	Insurance Claims & Policy Processing Clerks
			23	43-9051	Mail Clerks & Mail Machine Operators, Except Postal Service
			299	43-9061	Office Clerks, General
			7	43-9071	Office Machine Operators, Except Computer
			N/L	43-9199	Office & Administrative Support Workers, All Other
52.0901	Hospitality Administration/Management, General	5	x	11-9051*	Food Service Managers
			13	11-9081	Lodging Managers
52.0904	Hotel/Motel Administration/Management	8	x	11-9051*	Food Service Managers
			x	11-9081*	Lodging Managers
52.1201	Management Information Systems, General	49	x	11-3021*	Computer & Information Systems Managers
			x	15-1021*	Computer Programmers
			x	15-1061*	Database Administrators
52.1299	Management Information Systems & Services, Other	9	x	15-1099*	Computer Specialists, All Other
52.1401	Marketing/Marketing Management, General	14	6	11-2011	Advertising & Promotions Managers
			11	11-2021	Marketing Managers

			x	11-2022*	Sales Managers
			x	25-1011*	Business teachers, Postsecondary
(52.0101)	Business Commerce, General	5	x	11-1011*	<i>Chief Executives</i>
			x	11-2022*	<i>Sales Managers</i>
			x	11-3011*	<i>Administrative Services Managers</i>
			x	11-3051*	<i>Industrial Production Managers</i>
			x	11-3071*	Transportation, Storage & Distribution Managers
			x	11-9021*	<i>Construction Managers</i>
			x	11-9151*	<i>Social &amp; Community Service Managers</i>
			x	11-9199*	Managers, All Others
			x	13-1051*	Cost Estimators
			x	13-1111*	<i>Management Analysts</i>
			x	25-1011*	Business Teachers, Postsecondary
(52.0703)	Small Business Administration/Management	3	x	11-9199*	Managers, All Others
(52.0799)	Entrepreneurial & Small Business Operations, Other	9	x	11-9199*	Managers, All Others
(52.0903)	Tourism & Travel Service Management	29	x	11-9199*	Managers, All Others
			15	39-6021	Tour Guides & Escorts

	SUMMARY				
				Difference	
01.	Agriculture, Agriculture Operations & Related Sciences	16	33	17	
03.	Natural Resources & Conservation	34	1	(33)	
10.	Communications Technologies/Technicians & Support Services	29	67	38	
11.	Computer & Information Sciences & Support Services	65	76	11	
12.	Personal & Culinary Services	65	464	399	
13.	Education	52	290	238	
15.	Engineering Technologies/Technicians	162	167	5	
19.	Family & Consumer Sciences/Human Sciences	58	0	(58)	
22.	Legal Professions & Studies	6	23	17	
26.	Biological & Biomedical Sciences	4	1	(3)	
31.	Parks, Recreation, Leisure & Fitness Studies	7	29	22	
41.	Science Technologies/Technicians	3	23	20	
43.	Security & Protective Services	56	255	199	
46.	Construction Trades	133	636	503	
47.	Mechanic & Repair Technologies/Technicians	195	512	317	
48.	Precision Production	107	189	82	
49.	Transportation & Materials Moving	20	154	134	
50.	Visual & Performing Arts	43	15	(28)	
51.	Health Professions & Related Clinical Sciences	724	1645	921	
52.	Business, Management, Marketing & Related Support Services	512	1945	1433	
	Totals	2291	6525	4234	
		35%	100%	65%	
	Notation Key				
TC	Total completers from all institutions				
AP	Annual projected employment openings				
SOC title	Connotes values adjusted to less than bachelors estimate				
SOC*	Connotes a repeated SOC code				
x	Projection already used or SOC education level Masters or above				
(CIP code)	Connotes a similar CIP code to a MCCS program with similar SOC's				
N/L	Maine annual projection not published				
N/A	Not Applicable				